ACC.12
61st Annual Scientific Session & Expo
ACC-i2 with TCT innovation in intervention

E1142
JACC March 27, 2012
Volume 59, Issue 13

Imaging

LAYER-SPECIFIC ANALYSIS OF MYOCARDIAL DEFORMATION WITH 2D SPECKLE-TRACKING ECHOCARDIOGRAPHY FOR PREDICTION OF FUNCTIONAL RECOVERY IN ACUTE MYOCARDIAL INFARCTION

ACC Moderated Poster Contributions
McCormick Place South, Hall A
Saturday, March 24, 2012, 9:30 a.m.-10:30 a.m.

Session Title: Imaging: Echo Viability and RV Function
Abstract Category: 22. Imaging: Echo
Presentation Number: 1099-364

Authors: *Ertunc Altiok, Michael Becker, Christian Zwicker, Sandra Hamada, Ralf Koos, Nikolaus Marx, Rainer Hoffmann, Department of Cardiology, University Hospital RWTH Aachen, Aachen, Germany*

Background: The capability of myocardial deformation (MD) analysis by 2D speckle-tracking echocardiography of an endocardial and an epicardial layer for prediction of functional recovery after acute myocardial infarction (AMI) was evaluated and compared to contrast-enhanced magnetic resonance imaging (ceMRI).

Methods: In 48 patients (age 59±11 years) with first AMI all undergoing percutaneous coronary intervention (25 patients with ST-elevation) 2D transthoracic echocardiography (TTE) was performed for left ventricular wall motion analysis according to a 16 segment model. For each segment peak systolic circumferential strain for an endocardial and an epicardial layer was determined on the basis of 3 parasternal short-axis views. Additionally, ceMRI was performed for assessment of extent of myocardial infarction as relative amount of delayed enhancement. At 6-months follow-up 2D TTE was repeated for analysis of functional improvement in myocardial segments with impaired wall motion.

Results: MD analysis was performed on 169 segments with impaired wall motion as determined by 2D echocardiography. 86 (51%) of 169 myocardial segments showed functional recovery at 6-months follow-up. Segments with functional recovery had less relative amount of delayed enhancement compared to segments without improvement (19.2±26.0 vs. 50.1±30.0%, respectively; $p<0.001$) and circumferential strain was more negative in the endocardial layer (-27.1±12.9 vs. -17.2±9.9%, respectively; $p<0.001$) as well as in the epicardial layer (-14.7±8.2 vs. -10.1±6.8%, respectively; $p<0.001$). ROC analysis showed no significant difference in differentiating myocardial segments with functional recovery from segments without improvement between ceMRI (AUC 0.808, 95%CI 0.741-0.865) compared to endocardial layer strain analysis (AUC 0.723, 95%CI 0.649-0.789; $p=0.0675$), while accuracy of epicardial layer strain analysis was less compared to ceMRI (AUC 0.668, 95%CI 0.591-0.738; $p=0.0069$).

Conclusions: Layer-specific analysis of MD by 2D speckle-tracking echocardiography allows prediction of functional recovery in AMI with similar accuracy compared to ceMRI.